

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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SERIAL NO.:

FILED: Herewith

TITLE: PRODUCTION OF TETRABASIC LEAD SULFATE FROM SOLID STATE REACTIONS FOR THE PREPARATION OF ACTIVE PLATES TO BE USED IN LEAD-ACID BATTERIES

Preliminary Amendment: CLAIM AMENDMENTS

1. (Currently amended) A solid state reaction method for the production of tetrabasic lead sulfate by reacting 4PbO and PbSO_4 , comprising the steps of:

~~(a)~~ mixing ~~the~~ a stoichiometric mixture of 4PbO and PbSO_4 ;

~~(b)~~ heating the stoichiometric mixture of 4PbO and PbSO_4 at a temperature between 500 and 700°C ~~during~~ for 3 to 8 hours; and

~~(c)~~ deagglomerating and sieving ~~the~~ resulting tetrabasic lead sulfate.

2. (Currently amended) A solid state reaction method for the production of tetrabasic lead sulfate by reacting $3\text{PbO} \cdot \text{PbSO}_4 \cdot \text{H}_2\text{O} + \text{PbO}$, comprising the steps of:

~~(a)~~ mixing ~~the~~ a stoichiometric mixture of $3\text{PbO} \cdot \text{PbSO}_4 \cdot \text{H}_2\text{O} + \text{PbO}$;

~~(b)~~ heating the stoichiometric mixture of $3\text{PbO} \cdot \text{PbSO}_4 \cdot \text{H}_2\text{O} + \text{PbO}$ at a temperature between 500 and 700°C ~~during~~ for 3 to 8 hours; and

~~(c)~~ deagglomerating and sieving ~~the~~ resulting tetrabasic lead sulfate.

3. (Currently amended) A solid state reaction method according to claim 2, wherein said mixture of $3\text{PbO} \cdot \text{PbSO}_4 \cdot \text{H}_2\text{O} + \text{PbO}$ is obtained from active materials coming from ~~the~~ pastes used for ~~the~~ preparation of the lead-acid battery plates, or coming from recycled lead-acid battery plates.

4. (Currently amended) A solid state reaction method for the production of tetrabasic lead sulfate by reacting $5\text{PbO} + \text{H}_2\text{SO}_4$, comprising the steps of:

~~(a)~~ mixing ~~the~~ a stoichiometric mixture of $5\text{PbO} + \text{H}_2\text{SO}_4$;

~~(b)~~ heating the stoichiometric mixture of $5\text{PbO} + \text{H}_2\text{SO}_4$ at a temperature between 500 and 700°C ~~during~~ for 3 to 8 hours; and

~~(c)~~ deagglomerating and sieving ~~the~~ resulting tetrabasic lead sulfate.

5. (Currently amended) A solid state reaction method for the production of tetrabasic lead sulfate by reacting $4\text{PbO} + \text{PbCO}_3 + \text{H}_2\text{SO}_4$, comprising the steps of:

~~(a)~~ mixing ~~the~~ a stoichiometric mixture of $4\text{PbO} + \text{PbCO}_3 + \text{H}_2\text{SO}_4$;

~~(b)~~ heating the stoichiometric mixture of $4\text{PbO} + \text{PbCO}_3 + \text{H}_2\text{SO}_4$ at a temperature between 500 and 700°C ~~during~~ for 3 to 8 hours; and

~~(c)~~ deagglomerating and sieving ~~the~~ resulting tetrabasic lead sulfate.

6. (Currently amended) A solid state reaction method for the production of tetrabasic lead sulfate by reacting $5\text{PbO} + (\text{NH}_4)_2\text{SO}_4$, comprising the steps of:

~~(a)~~ mixing the stoichiometric mixture of $5\text{PbO} + (\text{NH}_4)_2\text{SO}_4$;

(b) heating the stoichiometric mixture of $5\text{PbO} + (\text{NH}_4)_2\text{SO}_4$ at a temperature between 500 and 700°C ~~during~~ for 3 to 8 hours; and

(c) ~~deagglomerating and sieving the~~ resulting tetrabasic lead sulfate.

7. (Currently amended) A lead-acid battery paste ~~made with~~ comprised of the tetrabasic lead sulfate obtained according to the method of claim 1, ~~the~~ production of lead-acid battery plates being made with said paste, and ~~the~~ production of lead-acid batteries being subsequently made with ~~them~~ the plates.

8. (Currently amended) A lead-acid battery paste ~~made with~~ comprised of the tetrabasic lead sulfate obtained according to the method of claim 2, ~~the~~ production of lead-acid battery plates being made with said paste, and ~~the~~ production of lead-acid batteries being subsequently made with ~~them~~ the plates.

9. (Currently amended) A lead-acid battery paste ~~made with~~ comprised of the tetrabasic lead sulfate obtained according to the method of claim 3, ~~the~~ production of lead-acid battery plates being made with said paste, and ~~the~~ production of lead-acid batteries being subsequently made with ~~them~~ the plates.

10. (Currently amended) A lead-acid battery paste ~~made with~~ comprised of the tetrabasic lead sulfate obtained according to the method of claim 4, ~~the~~ production of lead-acid battery plates being

made with said paste, and ~~the~~ production of lead-acid batteries being subsequently made with ~~them~~
the plates.

11. (Currently amended) A lead-acid battery paste ~~made with~~ comprised of the tetrabasic lead sulfate obtained according to the method of claim 5, ~~the~~ production of lead-acid battery plates being made with said paste, and ~~the~~ production of lead-acid batteries being subsequently made with ~~them~~
the plates.

12. (Currently amended) A lead-acid battery paste ~~made with~~ comprised of the tetrabasic lead sulfate obtained according to the method of claim 6, ~~the~~ production of lead-acid battery plates being made with said paste, and ~~the~~ production of lead-acid batteries being subsequently made with ~~them~~
the plates.